SOME

EXPERIMENTS

CONCERNING

MERCURY.

[Price One Shilling.]

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THEY who by Experiments have moſt diligently enquired into the Origin of Bodies, and their peculiar Powers and Properties, are the only Men who have diſcovered ſure Methods of acquiring a

true Knowledge of these Things: And whenever the Lovers of natural Knowledge enumerate the Instruments of this Science, they universally agree that Chemistry has done the greatest Service, in most industriously promoting such Discoveries: And when they come carefully to examine the most celebrated Writers in this Art, they plainly perceive, that the most ancient Alchemists far surpassed the rest in their Accounts of the Nature of Things. Of this *Geber* is an Instance, and the Writers nearest to him; for they are content to describe, in the plainest manner, such Things only as they had discovered by their Art; to improve which was their great Application, having no other Design in view. And indeed no other Men whatever have so strictly and obstinately labour'd in the Search after natural Things, or have taken such great Pains to turn Matter, thro' all the various Modes of Enquiry, as

the Alchemiſts. This is what will be readily granted by all thoſe who read the Hermetic Writers, when they openly relate common Diſcoveries: But, on the contrary, when theſe Writers treat of the Grand *Arcanum* (or Secret of the Wiſe) they are accuſed of making a bad Uſe of their Knowledge, out of a Deſire to conceal it, as if they intended, on that Occaſion, not to be underſtood. They are ſaid to deal in Paradoxes, to write in a ſtrange manner, perfectly foreign to all that is known, and their Style is ſwell'd with hyperbolical and ſublime Expreſſions; which makes them be exploded as Men out of their Senſes, fabulous, falſe, and Liars: For whilſt they affect to write in the graveſt Terms, and are rich in Promiſes, they ſo cover the Thing they are treating of in Obſcurity and Darkneſs, that they ſeem unwilling the Secret ſhould be reveal'd. And on this account it is, that very many

wiſe Men are of Opinion, that what the Alchemiſts promiſe, is a Thing impoſſible both to Nature and Art, and therefore count them unworthy the Peruſal of Philoſophers, as well as undeſerving of the Name. But it is a Maxim, That it is ſafer to credit an Artiſt in his own Art, than one that is an utter Stranger to it; and conſequently it is raſh to condemn what the Alchemiſts have defined to be poſſible; eſpecially, ſince theſe Chemiſts openly declare, that their Writings are to be weighed in the Balance of the moſt certain Laws of Nature, which have been diſcovered with the greateſt Evidence by the Events of Things; (that is, by exact and repeated Experiments) and they deſire not to be credited, whenever they produce any Thing contrary to the Powers of Nature truly known by Experiments. Moreover they alledge, that they expreſs themſelves in ſuch an obſcure manner, only

only to keep profane Perſons away from their Myſteries, which are unfolded to ſuch as are initiated in them; and ſo that it was neceſſary that Things ſtrange, obſcure, and often falſe, ſhould be mixed and interpolated with what is ſincere, clear, and true in their Writings.

For my part, upon looking into chemical Matters, and peruſing the Writings of the Alchemiſts, I have found them all of the ſame Mind and Meaning as to the following Particulars: That Metals are naturally generated in their Veins, are nouriſhed, grow, and multiply like other natural Things, each in their proper Place: That the Aliments or Nouriſhment of Metals, which before are of a foreign Nature to them, are, by the genital Power of the Metallic Seed, converted into a truly Metallic Nature; ſo that by this ſeminal Power alone they loſe their former, and re-

ceive a new Property by the ſole cheriſhing of the pregnant Warmth; for they will have all theſe Things to be effected entirely by the ſame Means: That as the Seeds of Animals and Plants change the Aliments they receive into their own Nouriſhment, ſo the vivificating Seed of growing Gold, having got a proper Food, in a fit Matrix, by the Help of a ſuitable and convenient Heat, digeſts the ſame into its own particular Nature: Therefore by that Means, according to a Law preſcribed to ſubterraneous Things, they determine that true Gold is always produced by Length of Time out of a Matter of a different Nature from Gold: For having ſubdued its Aliment by its own Force, it grows, by vital Increaſe, into a Matter like to it, ſo long as thoſe four Conditions that are abſolutely required attend it. Upon purſuing their Reſearches into Nature with more Accuracy, they diſ-

covered that the Metals which are produced, and eſpecially Gold, are very cloſely confined within a very ſolid and pure Stone, which is on every Side ſo very carefully cloſed up, that no Paſſage leading to or from the Metal can be diſcerned. The Matrix of the growing Metal is thick, hard, impenetrable, without Mixture, cloſed up on all Parts, and reſembles Glaſs. There is nothing more hard to underſtand, than to diſcern the Manner how the ſolid Subſtance of the Metal could penetrate or force itſelf thro' the ponderous Maſs of the hard Stone, into the Veins that are found pregnant with Metal and loaded with it. Nor is it leſs difficult to conceive by what Way the ſame Metal ſecretly paſſes into thoſe concealed Places, if it was liquid in its firſt Origin, as it is highly probable that it was. And thus the genuine Matrix of Metal is known; the Heat of the Metallic Mines is alſo known:

It ſeldom equals the Warmth of a Man in Health, but often ſinks below the 66th Degree in the Scale of *Farenheitius*'s Thermometer. Hence they who are verſed in theſe Myſteries direct, That the breeding Matter of the *Arcanum* ſhould be incloſed in a pure Glaſs Veſſel, and cheriſh'd with a *Majal Heat*; which we find, by Experience, to be of 50 Degrees. And this has been found out to be at a Medium throughout the Year, by the moſt exact Obſervations; which we owe to the induſtrious Care of *Cruquius*. The Food of the Metal remains yet more obſcure as to what is that ſeminal, proliferous and genital Matter. Moſt of theſe Philoſophers ſay, That Quickſilver is the common Matter of all Metals: That this being changed by the Power of the vital Seed, gives a Metal which is defined or determined according to the peculiar Property of the ſeminal

nal Efficacy: That every Metal, when the Quickſilver and this Metallific Power (which they call Sulphur) are maturely and, as it were, thoroughly boil'd and concocted, is brought to a perfect Species of each ſuch Metal. And from hence, That every Metal is again reſolved into theſe two Principles, Mercury and Sulphur. But that there is an original Flaw or Blemiſh inherent in Quickſilver from its firſt Production, that wonderfully grows up with it, and is intimately concreted to it, and therefore not without the greateſt Difficulty to be ſeparated from it; and conſequently the Quickſilver wou'd not be very ſimple, nor free, but is by that ſtrange Matter inherent in it, of a definite Nature, and therefore wou'd hardly ſuffer itſelf to be obſequious to the particular Virtue of the Metallic Seed, and be drawn into the ſingle Nature of one Metal: But if by a moſt difficult Art, the Quickſilver be thoroughly

roughly purged of that foreign Blemiſh or Foulneſs, then it would become liquid, metallic, moſt weighty, and moſt ſimple; neither by any Art or Nature diviſible into different Things; and in which the vivified Seed of every diſſolved Metal wou'd moſt perfectly multiply itſelf; in which the Gold itſelf diſſolving, being cheriſh'd and maturated, wou'd be the laſt ſo much ſought for, and ſo much celebrated Reward of the Labour.

When I found that the chief Perſons of the Art agreed in theſe Principles for a long Time, I have endeavour'd to learn by Experience, by what Artifice a pure unmix'd Mercury might be obtained? Whether it cou'd be extracted out of Metals? What is that other Part of the Metal that is apt to force under its Yoak the free Quickſilver, or Mercury? I am glad to give an Account of what I have

have diſcovered; not that I pretend to teach the Art, which I am as far from as any one; but I will faithfully relate ſome laborious Experiments, and which are ſo very certain, that they may juſtly paſs for true. Others will not need to repeat them, but may ſafely make uſe of theſe as true upon Occaſion. And a diligent Artiſt, by aſſuming (or ſuppoſing) theſe Experiments, may apply his Mind farther to others, in order to promote the Study of Chemiſtry the more. It were to be wiſh'd, that every Man directed his private Labours to the public Good. Let the firſt Experiment be this:

Experiment I.

Pure Quickſilver contain'd in a dry Glaſs Veſſel that is very clean, being agitated only by a mechanical Shaking or Concuſſion, gives a ſoft, black, and very fine Powder.

The Operation.

Having bought 16 Ounces of Quickſilver of the Company at *Amſterdam*, I ſtrain'd it thro' a Leather Bag; there remain'd no Dregs: I pounded it a long while with fair Water: The Quickſilver remained pure after pounding: It was then a long time pounded with Sea-Salt, but the Colour of the Salt was not fouled: after having poured Water to this Salt, and to the Mercury, the pounding was repeated; but neither did this change the Colour. In all this Work there appeared nothing black, nothing foreign or foul. Then the Quickſilver was waſhed and dried, and was bright. I poured it into a clean dry Glaſs Bottle, made of the dark-green *German* Glaſs. At the ſame Time I plac'd it in a Sand Furnace, with a Fire that almoſt made the Mercury riſe; and to be ſure that all

all the Water was forced out, which is often ſecretly preſent in the Mercury, I kept it thus for three Days: Then having thruſt a clean dry ſtrong Cork into the Mouth of the Veſſel whilſt it was yet warm, I faſten'd it up as cloſe as poſſible. The Head of the Bottle thus cloſed with a Cork, I dipt into a liquid Cement of Pitch, Roſin, Tallow, and Brimſtone, and covered it over with a Linnen Cloth, which I tied faſt with Packthread. When the Glaſs was thus made ready, I put it in a ſmall Wooden Box, which was ſo fitted to the Bottle, that it touched the Sides of it; and the empty Spaces between the Bottle and the Box, were well filled with Bran. Then I put on a Cover, with a Hole bored in the Middle, for the Top of the Neck of the Bottle to ſtand a little out. The Glaſs was immoveable in the Box; and it being thus prepared, I had it faſtened to the Hammering Block of a Ful-

ling-Mill, which always moves Night and Day when there is any Wind. Being thus fixed, it was rais'd up and let down by a perpendicular Motion, from the 1ſt of *March*, 1732. *N. S.* to the 13th of *November* of the ſame Year.

The Effect.

The Bottle being opened, there was the ſame Weight of Mercury, which was covered on all Sides with a very ſoft, black, copious and fine Powder. I ſqueez'd it thro' a clean Leather Bag; the liquid and pure Mercury paſs'd thro'. The Powder remained in the Bag of a ſharp metallic Taſte, ſomewhat reſembling the Taſte of Copper or Braſs.

COROLLARIES.

1. Quickſilver, in itſelf very inſipid, by meer ſhaking, acquires a metallic Taſte of Copper.

2. From

2. From being very mild, it becomes ſharp and penetrating.

3. From a very bright Silver Colour, it turns very black.

4. From a Fluid, it becomes Solid in the Form of Powder.

5. It may therefore be concealed under the Appearance of ſuch a Powder, and deceive the Ignorant.

Experiment II.

Quickſilver exceedingly well purified, and treated as aforeſaid (Exper. 1.) *gives the ſame Powder in much greater Plenty.*

The Operation.

I ſuſpecting that ſomething of a foreign Nature to it might remain in the Quickſilver, and be ſeparated

from it, by Motion, under the Form of that Powder, I brought over all the Mercury in a Glaſs Retort with a Sand-Heat. When it was all over, I pour'd it again into the ſame Retort, and forc'd it by Fire, as before. This Method I repeated 60 times. The Mercury was thus diſtilled 61 times. In the Bottom of the Veſſel there were five Drachms of Red Powder; of which hereafter. But this Mercury was very fluid and ſhining. I got 2 Ounces of this Mercury to be ſhaken by a Fulling-Mill in the ſame Manner, and by the ſame Operation, and for the ſame Space of Time as in the firſt Operation.

The Effect.

The Weight was the ſame: There was a Powder made, ſoft, black, of a ſharp metallic Taſte, like Copper or Braſs, to the Quantity of 2 Drachms and 26 Grains: So it was above an eighth

eighth Part; whereas of the Mercury, as they ſell it, ſcarce $\frac{1}{128}$ Part was turn'd into Powder by the ſame Operations; that is, by the ſhaking of the Mill.

Corollaries.

1. The Mercury, which after being diſtilled 61 times, yet remained very taſteleſs and inſipid, acquires a metallic Taſte.

2. From being very mild, grows ſharp and penetrating.

3. From having a bright Silver Colour, and ſhining like a Looking-Glaſs, becomes very black.

4. From being more fluid than it was naturally, comes to a conſiſtent Powder.

5. Tho' forced by a long and ſtrong Fire, ſo often repeated, the Mercury

Mercury ſtill retains this Property (of Fluidity).

6. Which therefore does not depend on any Feces or Dregs foreign to the Mercury, and that may be ſeparated from it by Fire.

7. The Matter which, after the Diſtillation of the Mercury, remain'd in the Bottom of the Retort, red, ſhining, and ſharp, is no more like the black Powder proceeding from the Shaking, than that Part is of the Mercury, which remained volatile.

8. Mercury is changed by Fire and Shaking; by Fire into red, by Shaking into black: Therefore Mercury changes Colour.

9. Whether Mercury ſhaken in a ſmaller Quantity, gives more of the black? (Powder)

Experiment III.

The very black Powder (by Experim. 2.) *if it is forced out of a Glaſs Retort by a ſtrong Fire, returns to pure Quickſilver.*

The Operation.

The 2 Drachms and 26 Grains of the black Powder (by *Operat.* 2.) I heated by a ſtrong Fire, and forced out of a pure Glaſs Retort, inſomuch, that at laſt the Retort was red hot for 2 Hours.

The Effect.

There were in the Receiver 2 Drachms and 2 Grains of the pureſt Quickſilver, inſipid and ſhining.

There

There ſtuck to the Sides of the Glaſs, which being join'd to the Retort, is luted to a Receiver full of Water, a little Quickſilver here and there, which I could not entirely gather together. In the Bottom of the Retort was a fix'd Spot, ſmall, very thin and fine, and but juſt viſible.

Corollaries.

1. Mercury, that has been 61 times diſtilled and ſhaken, and turned into the afore deſcribed Powder, returns by Fire alone into its firſt Form.

2. Of ſharp and penetrating, it becomes very mild.

3. Of very black, it comes to reſemble pure Looking-Glaſs, with a Silver Brightneſs.

4. Of

4. Of a conſiſtent Powder, it becomes very fluid.

5. In theſe three Operations it remains the ſame in itſelf; in the mean time it alters its Appearance under various Diſguiſes.

6. The Taſte and ſharp Power are wonderfully changed in the Mercury, by Motion alone, by Fire alone.

7. In the mean time there ariſes, from theſe Operations, out of the Quickſilver, a ſmall Quantity of fix'd Mercury.

8. The black (Spot) was no Dreg, or any Thing foreign, and ſo ſeparated from the Mercury.

Scholium.

I expoſed to a Fire of 180 Degrees, for ſeveral Months, ſome Quickſilver in Glaſs Conic Veſſels, with flat Bottoms, that were ſtopt with a chemical inverted Phial: The Quickſilver became black, and gave a black Powder, in all reſpects alike; from which I learnt, that a Fire in this Degree, produced the ſame Effect in the Quickſilver as the ſhaking.

Experiment IV.

Quickſilver is changed by ſimple Diſtillation.

The Operation.

18 Ounces of Quickſilver, Weight of *Amſterdam*, I forced by a Sand-

Heat, out of a pure Glaſs Retort, into the Receiver that was filled with the pureſt Water, 4 Inches high from the Bottom: This I continued to do till there was no more running Mercury left in the Belly of the Veſſel. I dried and cleaned the Mercury with clean dry blotting Paper, till it was perfectly dry, cleaned from any Dirt that might have fallen in, and from the Black which in diſtilling is raiſed every time with the Mercury as it diſtills: Then I poured this Mercury into another Retort, and forced it again as before. This I repeated in the ſame manner 52 times. In each Diſtillation there was produced in the Retort a red ſhining Powder.

The Effect.

There was then four Drams and a half after 52 Diſtillations of a ſharp,

red, ſhining Powder, purging upwards and downwards: There remained 16 Ounces and 5 Drachms of Quickſilver; ſo 6½ Drachms were loſt. This could not be help'd. Some part expires thro' the Glew; ſomething black, with a little Quickſilver, ſticks to the Blotting-Paper every time the Mercury is dried. This is but very little at one time; but when the Work comes to be often repeated, it comes by Degrees to be a conſiderable part. The Powder produced was heavy, of a red ſhining Colour, very brittle, of a very ſharp, metallic Taſte, nauſeous, penetrating, hardly to be taken out of the Mouth, diſordering the Human Body very much, and for a long time, and diſpoſing to Excretions. The Mercury which had been thus treated, appeared more fluid than common Mercury.

COROLLARIES.

Corollaries.

1. Quickſilver thus forced by Fire, is turned from a Fluid into Powder, in about the $\frac{1}{28}$ part of its whole Weight.

2. From a Silver Brightneſs, like Looking-Glaſs, into a ſhining red Colour.

3. From very inſipid Taſte, into one very ſharp, rough, metallic, and penetrating.

4. From very mild, into ſharp, virulent, venomous, diſordering the Body, and exciting Pains.

5. From volatile into more fixed; which is no longer volatile by the ſame Degree of Fire as it flew up with before.

6. As

6. As to its other part, it changes into more fluid, in other reſpects like what it was before.

7. When the Veſſel is ſtopt cloſe, a mechanic Motion, and a ſmall Fire, give Quickſilver a black Colour; a greater Fire gives it a red Colour.

Experiment V.

I was deſirous to know what would happen to the Mercury, if it was ſtill forced by a Fire requiſite to Diſtillation.

The Operation.

I took care to diſtill, as before, the 16 Ounces and 5 Drachms of Mercury remaining from the former Operation: I diſtill'd it ſo long, 'till

'till there remain'd none in the Bottom. What was came over, being cleaned and dried, I always poured again into the ſame Retort. This Work I repeated 448 diſtinct times. Now this Mercury had been forced by Diſtillation compleatly 500 times: It had riſen always more fluid and pure. The laſt time I heated the Fire more, but then the red Powder ſeem'd rather to be leſſened than increaſed, perhaps being in part revived.

The Effect.

The Powder in the bottom of the Retort, weigh'd 1 Ounce, 5 Drams, and 21 Grains. The Mercury remaining after 500 Diſtillations, weighed 9 Ounces and 5 Drachms: But it happen'd, in ſo often diſtilling, that ſometimes the Retorts broke, and ſo ſome of the Mercury got

got away, beſides what was loſt by ſo often cleaning and drying.

Corollaries.

1. The Corollaries of the ſecond and fourth Operations, are likewiſe true in this Operation.

2. The Mercury is very unchangeable in one part,

3. Yet continually changeable in the other part.

4. Out of the altered Form, perhaps it returns into its former Shape.

5. And perhaps after Regeneration by a new Action of Fire, it is carried back again into the altered Shape.

Experiment VI.

That Property of Quickſilver, by which it is turned into this Powder by Fire, is hardly taken from it by Diſtillation.

The Operation.

The very fluid and very pure Mercury (out of which I had made by 501 Diſtillations, 2 Ounces, 1 Drachm, and 51 Grains of Powder, by the 2^{d}, 4th, and 5th Operations) which remained to the Quantity of 10 Ounces, 5 Drachms, and one half, I diſtilled out of a pure Glaſs Retort, till the Mercury was all paſſed thro' into the Receiver. The Bottom of the Retort was as clean as if it had been juſt taken out of the Furnace at the Glaſs-Houſe: But

at the Edge of the Surface, where it had ſtood before the Diſtillation in the Belly of the Retort, there was a ſhining Ring, of a beautiful red, fine and fair to the Eye. The Mercury that came out, being purified and dried, I poured again into the ſame Retort, and forced it into the Receiver. This was repeated ten times: Every time more of the red Powder was made, and in no leſs Quantity then from the crude Mercury.

The Effect.

The Mercury very vivid and very bright; the fix'd Powder of a beautiful red, but (as in 2^{d}, 4th, 5th Operations) to the Quantity of ſeven Grains.

COROLLARIES.

1. The Mutability of Mercury into this Powder by Fire, ſtill remains

in the Mercury, after an eighth part of it has been changed into the Powder.

2. After 511 Diſtillations, each of which had produced ſome of that Powder, this Mutability remains, altho' no new Mercury has been added.

3. Therefore that Powder is ſcarce to be accounted the Dregs or Feces ſeparable by Diſtillation from the intimate Subſtance of the Mercury.

4. And hence it is certain the Mercury is ſo changed by this Means; but it is not certain that it is by this Means defecated.

5. Fire is not united to Mercury, as ſome celebrated modern Chemiſts have ſaid it was, in their Writings.

6. Diligence can ſcarce teach the conſtant Artiſts thoſe Bounds beyond which that Powder is no longer produced.

7. If that Powder is produced by Fire out of the crude Sulphur of Mercury, this Diſtillation does not purge the Mercury from it.

Experiment VII.

To examine the Powder produced by 2^{d}, 4th, 5th, 6th *Operations.*

The Operation.

Two Ounces, 1 Drachm, and 51 Grains of that Powder, I put into a clean Glaſs Retort, covered with a Coat of Clay, mix'd or temper'd with Sand. I heated it by Degrees, till

till at laſt the Retort, the bare Fire being laid over it, grew almoſt red with the bright Fire that covered it in the Sand Furnace, for three Hours together.

The Effect.

There came out 1 Ounce, and half a Drachm of pure Mercury revived from that Powder: There remain'd in the Bottom of the Retort ſeven Drachms and a half of the bright red Powder. Something ſtuck in the Neck of the Retort, and in the Glaſs Veſſel applied to the Neck of the Retort. Perhaps ſome was diſſipated by ſo great and laſting a Fire.

Corollaries.

1. The Mercury returns out of the Powder into which it was turned by the Fire.

2. Being

2. Being revived, it recovers all its former Properties, and lays aſide all thoſe that it had acquir'd. Out of the Powder comes the ſame Mercury as at firſt.

3. The acquired Fixedneſs does not bear a great Fire.

4. Yet in that Powder one part is more fixed than another; this ſtill remains a Powder, that returns to Mercury.

Experiment VIII.

Further to examine the Powder remaining after the foregoing Operation.

The Operation.

Seven Drachms and 37 Grains of that Powder in a very clean Glaſs Retort,

Retort, caſed over with a Coat of Sand and Clay, I put into the naked Fire, which was carefully increaſed by Degrees, 'till the little Retort, which was entirely covered with the Coals, grew quite red hot. In this Degree of Heat I kept it for four Hours.

The Effect.

In the Receiver was ſeven Drams of moſt pure Mercury reviv'd from this Powder. In the Bottom of the Retort were 15 Grains of a dark, ſubtle, and fixed Powder, in ſo ſtrong and laſting a Fire. There was a broad Spot, very thin, of a beautiful red, impreſſed on the Bottom of the Retort, and, as it were, penetrating into the Glaſs.

COROLLARIES.

1. Mercury by Fire alone is changed into the Powder above deſcrib'd. (2, 4, 5, 6, 7, 8.) 2. This

2. This Powder, by Fire alone, but a ſtronger, is changed into Mercury.

3. Thus the Serpent that has bitten itſelf dies.

4. It ariſes again more glorious from Death.

5. So much Labour, and ſo great Fire being ſo long ſuſtain'd, out of 17 Ounces of Mercury, only 15 Grains remain'd fix'd in the Glaſs, which was ſo hot, that it was ready to melt.

6. Silver, Gold, and other Metals ſought for by this Art out of Quickſilver, is ſcarce any, in Proportion to the Charge and Labour.

7. Of the Powder ſo fix'd from Mercury, only the 72^{d} Part remains fix'd in this Fire, the reſt returns to Mercury. 8. Twenty-

8. Twenty-two Grains were loſt. Were they diſpers'd? or was this Quantity of Weight firſt accreted to the Mercury by Fire, thence again ſeparated by a ſtronger Fire?

9. The Nature of Mercury is conſtant, ſimple, and cannot be ſeparated into diſſimilar Parts by Diſtillation; not into fix'd and volatile; not into pure and impure; not into feces and defecated; not into different Elements.

Experiment IX.

I put thirteen Grains of this laſt fix'd Powder (VIII.) *into a Crucible, and ſet it over an open Fire before the Bellows: I increas'd the Heat of the Fire, by blowing till the whole Crucible was red hot: I kept it ſo for a Quarter of an Hour. The Powder remain'd fix'd in the Bottom, but ſwell'd up like a Spunge,*

and of a dark Colour. From hence I learn'd that this Powder had acquired a conſiderable Degree of Fixedneſs by Fire alone.

Experiment X.

Then I added to this fix'd Powder (IX.) *ſome Borax in a Crucible, and increaſed the Fire by blowing. It became one Maſs, brittle, growing like Glaſs, and fix'd in this great Fire.*

Experiment XI.

I gave 2 Grains of that Powder, which had remained fix'd, to the Weight of 15 Grains (VIII.) *to a ſworn and very skilful Eſſayer of Metals at* Amſterdam, *to examine it with all poſſible Accuracy according to the Rules of Art, with Lead. Nothing fix'd remain'd: Therefore in that Powder there was not the leaſt Gold or Silver.*

Experi-

Experiment XII.

The thirteen Grains melted down with the Borax into a Maſs growing like Glaſs (almoſt vitrified) (x.) *I gave to a ſworn and very skilful Eſſayer of Metals at* Amſterdam, *to examine this whole little Maſs with the greateſt Accuracy, according to the Rules of Art, in Lead. Nothing fix'd remain'd of the whole Maſs; ſo there was no Gold nor Silver in it.*

Corollaries.

1. Quickſilver perſiſts in the Fire, retaining its Nature unalterable.

2. Simple, and not ſeparable, into different Parts by Diſtillation.

3. It is fixed by Fire, and ſeems changed in its outward Form.

4. Appearing ſo, in various Parts, it acquires different Degrees of Fixedneſs.

5. Yet none of theſe Parts acquired, by ſo ſtrong and laſting a Fire, the Fixedneſs of Gold or Silver.

6. The fixating Cauſe is Fire paſſing thro' the Glaſs; thus changing part of the Mercury, either by its ſimple Action, or by its uniting itſelf with the Quickſilver.

7. The Fire ſo acting, by 511 Diſtillations, by its Action or Conjunction, could not yet change the ſmalleſt Particle of the Mercury into Gold or Silver.

8. But from the Mercury ſo fixed by Fire, a greater Fire reſtores true Mercury; or the known Power of Lead makes it vaniſh out of the Cupell.

9. There-

9. Therefore it does not appear, by theſe Experiments, that from Mercury and Fire ſo conſpiring, any known Metal is produced. Thoſe 13 Grains did not run by a Wind-Furnace; they did not perſiſt in the Lead; they were not diſſolved with the Mercury into an Amalgama.

10. Therefore Fire, by theſe Experiments, is not demonſtrated to be the Sulphur of the Philoſophers that fixes Mercury into Metals.

11. But it ſeems probable that the Sulphur of the Philoſophers is ſomething elſe very near it.

12. The fixed part is not the Feces of Mercury, nor its crude generating Sulphur; it returns into Mercury.

13. The

13. The Depuration of Mercury from the earthy Feces, and the watry Crudeneſs, ſeems ſcarcely to be obtained ſo eaſily by Diſtillation alone; perhaps by ſome more ſecret Work it is obtain'd.

14. To make Gold or Silver of Mercury, does not proceed. Ignorant Men are given up to Imagination, eaſy to Promiſes, rich in Hope. This Mercury remained Mercury.

15. Safe from the fallacious Writings and Preſcriptions of the Philoſophers, who promiſe ſuch Things in a ſhort Time, or a few Months from Mercury and Fire: Indeed, within the Space of many Years, I have not diſcovered the leaſt Marks of a firſt beginning.

Experiment XIII.

Mercury kept under boiling Water, is not rais'd from the Bottom of the Veſſel.

The Operation.

I pour'd a Drachm of Mercury twice diſtilled into a Glaſs Urinal, which I fill'd with Rain Water: Then I ſet the Veſſel upon the naked Fire: The Water boil'd ſtrongly for eight Hours, yet ſo that there ſtill was ſome Water ſwimming over the Mercury. The Mercury being afterwards weigh'd, gave a Drachm without any Loſs.

Again; I pour'd a Drachm of Mercury into a clean dry Glaſs Veſſel. This I ſo fitted in a Kettle, that it cou'd not fall aſide. I filled the Kettle with Water; I made the Water

Water boil eight Hours. This Veſſel was cylindrical, open, two Inches and one half deep, and placed ſo that the Water cou'd not get in. After this was ſo done, the Mercury weighed one Drachm without any Loſs.

I put pure Mercury into a Glaſs Veſſel, I poured Water upon it; and ſetting the Still over it, I boil'd it for a long while: No Mercury aſcended. I continued boiling, till all the Water being gone out, the Mercury remained dry in the Bottom of the Veſſel. However, I did not then increaſe the Fire; but the Mercury preſently aſcended to the Sides of the Veſſel, and into the Head. The Reaſon of this appears from what I have written in my chemical Inſtitutions about Water and Fire.

Experiment XIV.

Mercury may be chang'd by Art ſo as that it ſhall aſcend from the Bottom of the Veſſel, by the Heat of Vinegar, before it boils up.

The Operation.

Having made a Maſs of a Pound and a half of Mercury, with half a Pound of Lead (the Chemiſts call ſuch a Maſs an Amalgama) I ſhook it in a Glaſs Veſſel. There was produced a very black Powder. This I put into a Glaſs Cucurbite 14 Inches high; I pour'd pure diſtill'd Wine-Vinegar over it. By a gentle Diſtillation I took away the Phlegm. I then increaſed the Heat a little, but ſo that the Liquor did not boil. The Mercury aſcended into the

Head, together with the Phlegm, and thence into the Receiver. The ſame I tried and experienced other Ways. It is a Circumſtance worthy a Chemiſt's Speculation; but I ſhall ſay no more of it here. By much the like Artifice, I have ſeen Quick-ſilver made ſo volatile, that it was rais'd in my Digeſtory-Furnace with a leſs Degree of Heat, than that of a Man in Health, and aſcended to the Sides of the Veſſel. Do you think the Mercury was then purer? It was mix'd with Metal, and very dry. But perhaps I may ſome other time relate ſome very laborious Experiments which I have made for ſeveral Years, in examining Mercury and Metals, if I find that ſuch Things are likely to meet with the Approbation of the Learned.

EXPERIMENT

Experiment XV.

Geber *has written, that pure Mercury is heavier than Gold: For a long time I endeavour'd to learn, Whether Mercury could be brought to a denſer, and conſequently a heavier State, than that it is naturally in? I began to attempt this by a Separation of the lighter and more changeable Part, from the more heavy Remainder, but cou'd not do it. I afterwards ſtrove to defecate it by various Methods: It did not ſucceed. However, I diſcovered ſome Things that deſerve the Contemplation of curious Obſervers, which I beg leave to mention, as follows: Two Ounces of pure Gold in a Maſs, by hydroſtatical Examination, in Rain-Water, defecated by gentle Diſtillation, I*

found to weigh in proportion to Water, as $19\frac{119}{500}$ *to* 1. *Common Mercury, as ſold, once diſtilled from the Retort to the ſame Water, weighs as* $13\frac{57}{100}$ *to* 1. *Mercury amalgamated with pureſt Gold, and then diſtilled ſome hundred times, as* $13\frac{55}{100}$ *to* 1. *Mercury ſo treated with the pureſt Silver, was to Water as* $13\frac{57}{100}$ *to* 1. *Mercury united with Lead, and with it all turn'd into Powder, and thence reſuſcitated by a ſtrong Fire, was to Water, as* $13\frac{58}{100}$ *to* 1. *Mercury* 511 *times diſtilled, was as* $14\frac{11}{100}$ *to* 1.

Theſe Statical Weighings were made by Inſtruments that cou'd not be found fault with, and with the moſt prudent Care. I ſpent ſome Years to prepare Mercury for this Purpoſe; and, for ought I know, no one elſe has had any Regard to it. Afterwards, many Things proper for Meditation

Meditation may be drawn from thence, by proper Judges in this Matter: But I may be allowed to make a few Obſervations.

Corollaries.

1. If Mercury, when defecated, becomes lighter, then it is rendred moſt defecated by Gold and Lead. By the Art of *Suchtenius* and *Philalethes*, it remains the ſame.

2. If Mercury, when defecated, becomes heavier, then it is rendred moſt defecated by Silver, in proportion to other Metals; but moſt of all by ſimple Diſtillation, by a Converſion into a Red Præcipitate of itſelf, and a Reſuſcitation thence made.

3. Mercury may be made thicker (condenſated) by Silver and Fire.

4. Mercury

4. Mercury may be thickned by Diſtillation by Fire moſt of all. Is this then the beſt Way to depurate and perfect it?

5. Does Mercury depoſite its heavieſt Part in Gold? Is this depoſited Matter the Seed of Gold?

6. Does Mercury depoſite its heavieſt Part in Lead? Is this depoſited Matter the Seed of Gold?

7. Does Fire, boiling the Mercury 511 times, fixing and reſuſcitating it, increaſe that heavieſt Part? Can Mercury, by a continued Work, at length be thickned into the Weight of Gold? Would it then be live Gold, or the Mercury of the Philoſophers? This let proper Judges examine.

Let

Let theſe few Remarks, and yet not made without Trouble and Caution, concerning the Purification of Quickſilver, ſuffice at this time. I have ſome by me much more operoſe concerning the extracting of Mercury out of Metals, of its Action upon Metals, of Metals themſelves; perhaps, when I have Leiſure, I may offer them to the Public, that Perſons, after being warned, may ſpare a fruitleſs Labour and Expence. *Farewell.*